Multi-function quantitative controller (Quantitative control)

operating instruction

Preface

- Thank you very much for using the intelligent LCD flow quantitative controller produced by our company!
- This manual provides methods about the performance indicators, installation wiring, operation operation, parameter setting, fault diagnosis and other aspects of the instrument in use. Before operation, please read this manual carefully, and then master the specific operation, so as to avoid unnecessary losses caused by wrong operation.
- After you have read, please keep the place that is easy to read at any time for reference during operation.

Statement

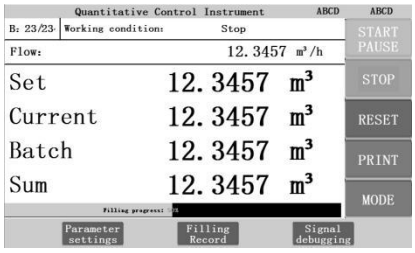
- The contents of this manual are subject to notice due to function and performance upgrades.
- The contents of this manual are not strictly reproduced or reproduced in whole or in part.
- Our company tries to ensure that the contents of this manual are correct. If you find any mistakes or mistakes, please contact us.

Edition

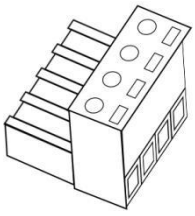
3630-V 2.0.0

Boxed items

Please confirm the following before you open the box. If you receive any product, quantity or physical damage, please contact our company or sales outlets.

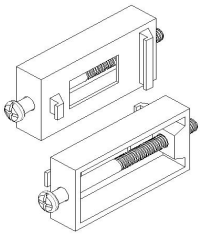


Flow



binding

operating



mounting

certificate

order number	name	quantity	remarks
1	Flow quantification controller	1	
2	Mounting bracket (with screws)	2	For disk installation and fixing
3	instructions	1	
4	certificate	1	
5	binding post	5	

Matters need attention

- If the instrument is damaged and caused by transportation, please contact the manufacturer.
- This series of instruments is suitable for general industrial occasions, if there are special use requirements, please set up additional protection devices.
- For the safety of your and the instrument, do not install live. Please use the power supply with rated voltage, connect correctly and ground properly. After connecting the power supply, please do not touch the wiring terminal at the back of the instrument to prevent electric shock.
- The instrument should be installed in the installation position, ensure smooth ventilation (in case of excessive temperature inside the instrument), avoid wind and rain and direct sun, do not install in the following occasions:
  - Temperature and humidity exceed the use conditions
  - Conditions of a corrosive, flammable, or explosive gas
  - There are a lot of dust, salt and metal powder occasions
  - Water, oil and chemical liquids are easy to sputter
  - There is a direct vibration or impact of the situation
  - The occasion of the electromagnetic occurrence source
- Take corresponding shielding measures near the power line, strong electric field, strong magnetic field, static electricity, noise or AC contactor interference.
- To extend the service life of the instrument, please conduct regular maintenance and maintenance. Do not repair and disassemble the instruments by yourself. Please wipe the instrument with clean the soft cloth, do not dip in alcohol, gasoline and other organic solvents to clean, may cause discoloration or deformation.
- If the instrument has water, smoke, odor, abnormal noise, please cut off the power supply immediately, stop using it, and contact the supplier or our company in time.

CATALOGUE

Chapter 1 An Overview of

1.1 Product Introduction

Intelligent liquid crystal flow quantitative controller is a professional intelligent quantitative control product developed by our company on the basis of domestic and foreign petrochemical, liquid material, material material and other quantitative control experience. It is an intelligent instrument with industrial ARM core CPU as the core, with the characteristics of high accuracy, fast response, easy to operate and diverse functions. It can realize a complete stand-alone control system with flowmeter, level switch, thermometer, bit meter, weighing meter, control solenoid valve and pump body; and connect with microcomputer to realize distributed logistics control system for remote monitoring and data sharing. Suitable for petroleum, chemical, agriculture, medicine, food and other industries of quantitative filling, quantitative beating / feeding, charging, ingredients, discharge, sorting, filling and other automatic control system.

The intelligent liquid crystal flow quantitative controller has a pulse signal that can access to vortex street and turbine flowmeter, analog volume signal of flow and liquid level, and serial port communication signal of barmeter and flowmeter.

Intelligent LCD flow quantitative controller has flexible configuration interface, all liquid crystal design, modify the set point is simple and convenient, built-in large capacity contact relay, and has no-load operation protection alarm, prevent abnormal flow, pump body dry pump wear, high reliable running life design, is your ideal quantitative filling, filling products.

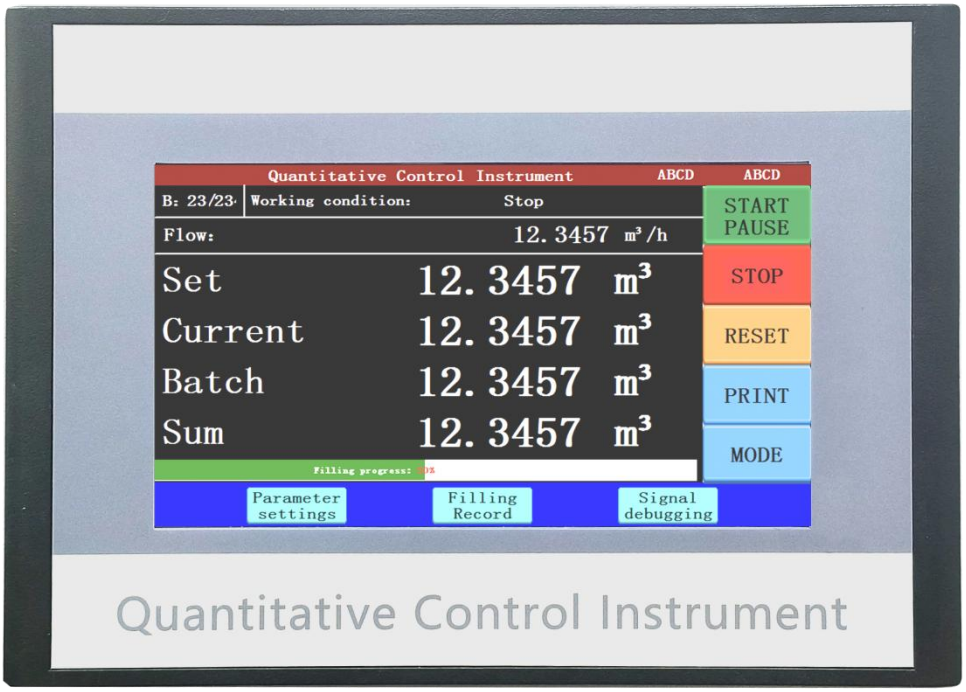
1.2 Product characteristics

- The high-performance industrial-grade ARM CPU embedded processor is adopted to realize the automatic and intelligent quantitative control.
- 7-inch LCD screen, real-time display of instantaneous flow, quantitative, component, batch, total amount.
- Full LCD touch design makes it easier to set the working mode, batch, quantitative and other technical parameters.
- It has the automatic and intelligent cycle filling function according to the quantitative interval time of each batch.

- Custom formula Settings, can be arbitrarily preset selection any formula, automatic cycle to improve work efficiency.
- It can realize pulse frequency input, 4-20 mA input and serial communication input.
- 2 sets of valves and 1 set of pump control and extended.
- Bill printing function is optional.
- Industrial-grade quality assurance, stable and reliable performance, cost-effective.

Chapter 2 Technical specifications

2.1 Product appearance



2.2 Technical parameters

name	configure
Power Supply Voltage	DC12-24V 5W
screen	A 7-inch LCD display
incoming signal	Flow pulse: 0 ~ 5 KHZ low level 1V, high level 10V Flow simulation signal: 4-20 mA Flow serial port signal: 9600bits / s Temperature analog volume signal: 4-20 mA
output signal	The output contact capacity of the 3-way relay is 220VAC 5A 30VDC 5A
interactive mode	Formula custom 4 switch volume return to start / pause, stop, clear, print
External power supply	Road DC24V 1A

display mode	7-inch industrial display (configuration)
accuracy	The detection accuracy is related to the selected instrument used The flowmeter of the pulse signal output has no acquisition error The flowmeter acquisition error of the simulated signal output is <0.1% No collection error for the serial signal output Valve control quantification accuracy of 0.2%
Set quantitative	Formulation custom Settings, a variety of batches, quantitative value, advance working mode fast switching
The clock error	± 2 seconds / day
communication	Print bill interface (optional) The first RS485 communication system supports the modbus RTU protocol
service condition	Ambient temperature: - -20℃ ~70℃ Air relative humidity is <95% (no condensation)
size	Screen dimensions: 226 * 163mm (length * width) Overall size of main frame: 120 * 100mm (length * width)

pay attention to

- The technical parameters are the general indicators of this series of instruments, and the functional configuration is subject to the physical object.
- If the technical parameters are not consistent with the physical instrument, please take the physical object.

Chapter 3 Installation of wiring

3.1 Installation prompt

Explain the installation site and installation method of this instrument. Please read this part when installing.

Installation considerations:

- This instrument is distype. Please install it indoors to avoid wind and rain and direct sun.
- To prevent rising temperature inside this instrument, install in a well ventilated place.
- When installing this instrument, please do not tilt the left and right, and try to install it horizontally.

Avoid the following places:

- Direct sunlight to where and near the hot appliance.
- Places where the ambient temperature exceeds 50℃.
- Places where the ambient humidity exceeds 85% at work.
- Near the source of the electromagnetic generation.
- A place with a strong mechanical vibration.
- Where the temperature changes greatly and is easy to dew.
- Where fume, steam, moisture, dust and corrosive gases.

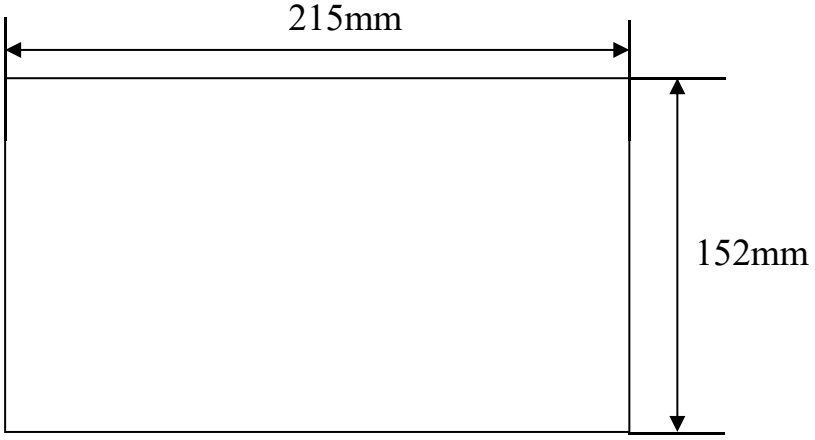
3.2 Installation method

Use a 1.5~6.5mm steel plate for the dashboard.

1. Place the instrument from the front of the dashboard.
2. Install the installation bracket with the instrument as shown in the following figure.

- Fixed on both sides of the instrument with mounting supports.
- The screws used for the dashboard mounting bracket are M4 standard screws.

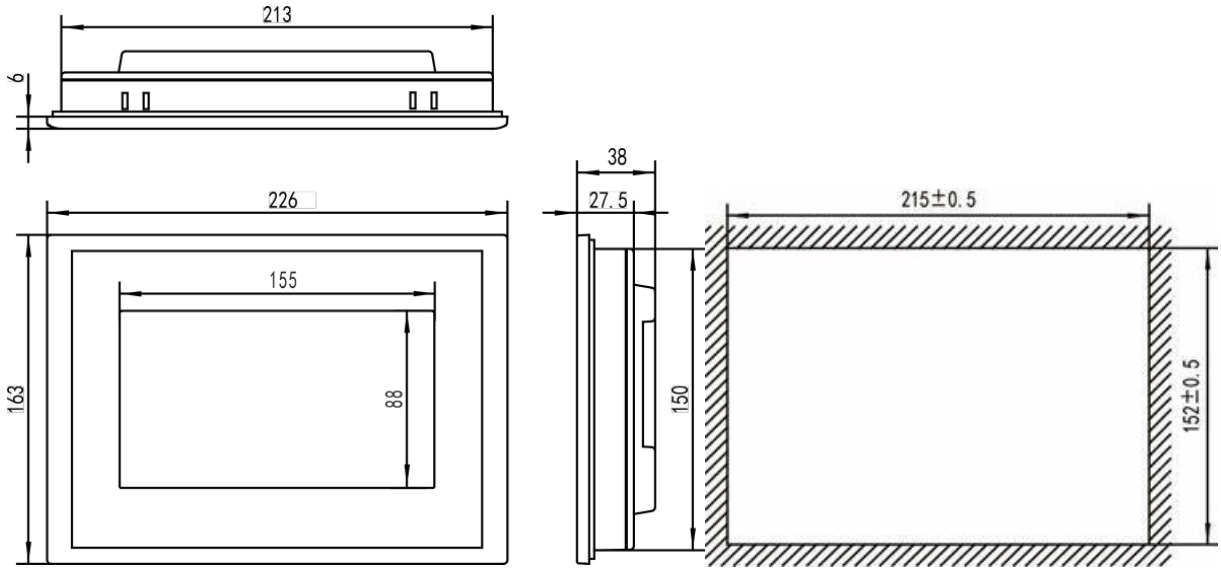
3.3 Opening size



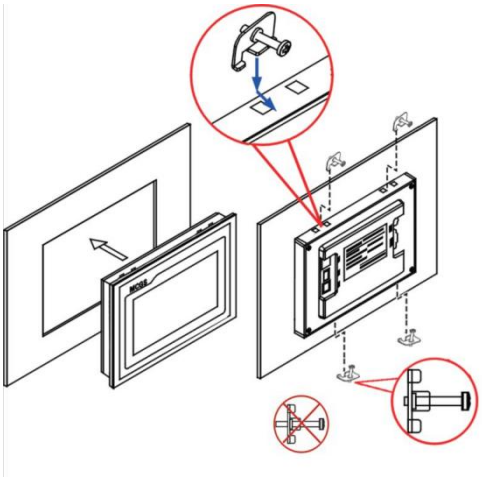
When installed centrally, the minimum spacing between the instruments is 20mm to ensure the

necessary heat dissipation and loading and unloading space. The above drawing unit is: mm.

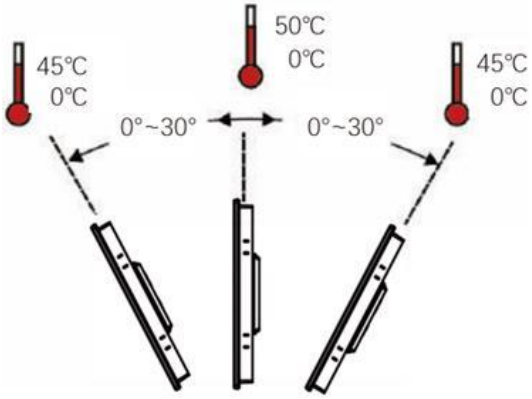
3.4 Instrument installation drawing



method of erection:



Linked
installation



Installation
Angle

3.5 Instrument wiring

To improve the safety of the instrument, please observe the following warnings:

pay attention to

- To prevent electric shock, confirm that the supply is cut before wiring.
- To prevent fire, use a double insulated wire.
- Please set the air switch in the power supply circuit to separate this table from the main power supply.
- Tighten the terminal screws firmly. Tightening torque: 0.5N.m（5kgf.cm）。
- After connecting the power line, the power supply should be connected to check whether the instrument is normal. Please do not connect the signal line before this. After confirming that the instrument is working normally, disconnect the power supply and then connect the signal line.
- The measuring loop and the power loop should be laid separately. The measuring object is preferably not a interference source. Once unavoidable, please insulate the measuring object from the measuring loop and ground the measuring object.
- For static interference, the use of shielding line is better.
- For the interference generated by electromagnetic induction, it is better to measure the circuit wiring at equal distance.
- If the input wiring is connected in parallel with other instruments, the measurements will affect each other. When it is necessary to go in parallel, please do not switch the power supply of one of the instruments during operation, which will have adverse effects on the other instruments. Thermoelectric resistance cannot be in parallel in principle, and current signal cannot be in parallel in principle.
- Platinum resistance input each lead resistance shall be less than 10 Ω (the same lead resistance).

Upper row Defindefinition:

Terminal name	description
RB	Unused
RA	
RB	Bill and printer interface
RA	
RB	modbus RTU Agreement interface
RA	
RB	Screen interface
RA	
NC	
NC	
F0V	The maximum output of DC power supply is 0.2A
F+	
F24	Flow pulse input to 0-5 KHZ
TB-	Temperature analog quantity is input to 4-20mA
TA+	
Q0V	The maximum output of DC power supply is 0.2A
Q+	
Q24v	Flow analog quantity input 4-20mA

Lower row end definition:

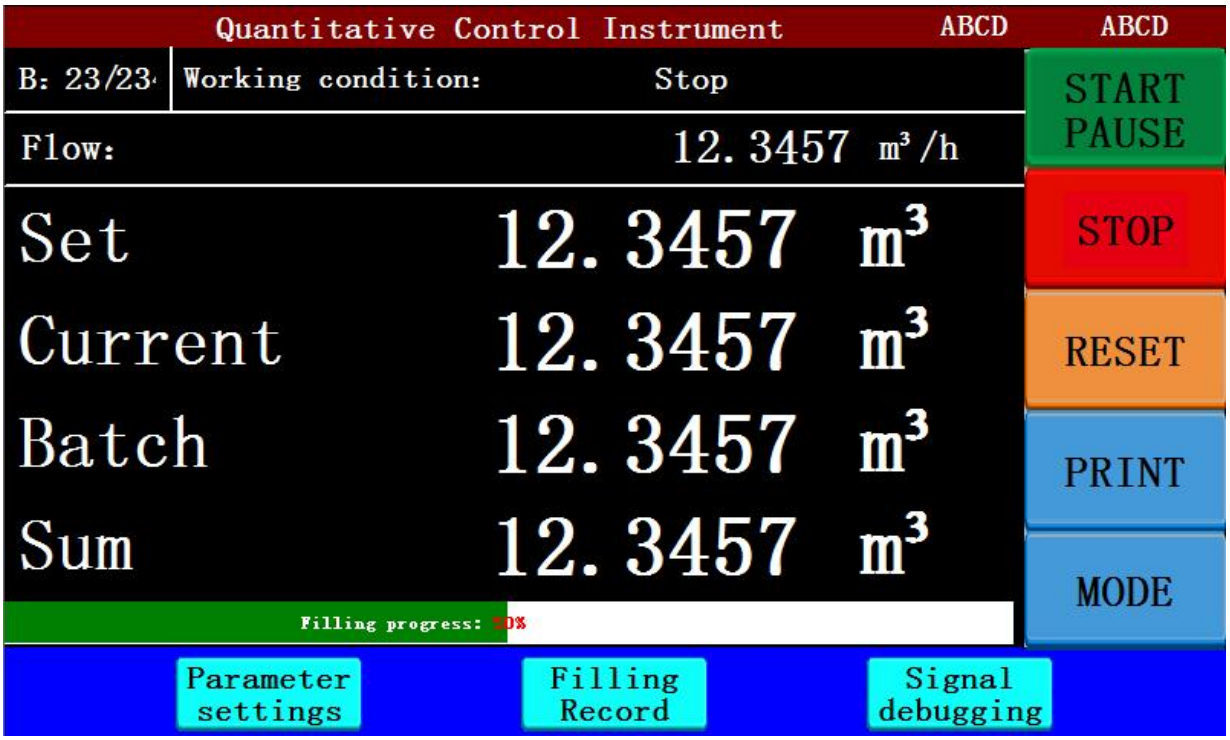
Terminal name	description
V+	Power supply is 24V DC
V-	
+24V	DC24v output
0V	
Kcom	Button Enter the common point
K1	Start the \ pause button
K2	stop button
K3	Zero button
K4	Print the button
K5	Working mode switch button
K6	Unused
D01	Solenoid valve 1 relay 1 open contact solenoid valve 2 relay 2 open open contact maximum load current 220V 5A
D02	
COM	
DO3	220V 5A
COM	
DO4	Unused
DO5	Unused

pay attention to

- The power supply voltage of the project site shall be limited to the withstand voltage range of the instrument.
- Please do not plug the communication cable.
- The basic wiring diagram is given in this description. When the instrument function conflicts with the basic wiring diagram, please take the physical object to prevail.

Chapter 4 Instrument display and operation

4.1 Operation interface operation



The running interface is the main interface, which displays the running data and running status of the current device in real time.

Device status includes:

Waiting for the start: Device waits for the start command.

Filling: Equipment is in operation.

Pause: Device pause phase, press the pause button again to continue running.

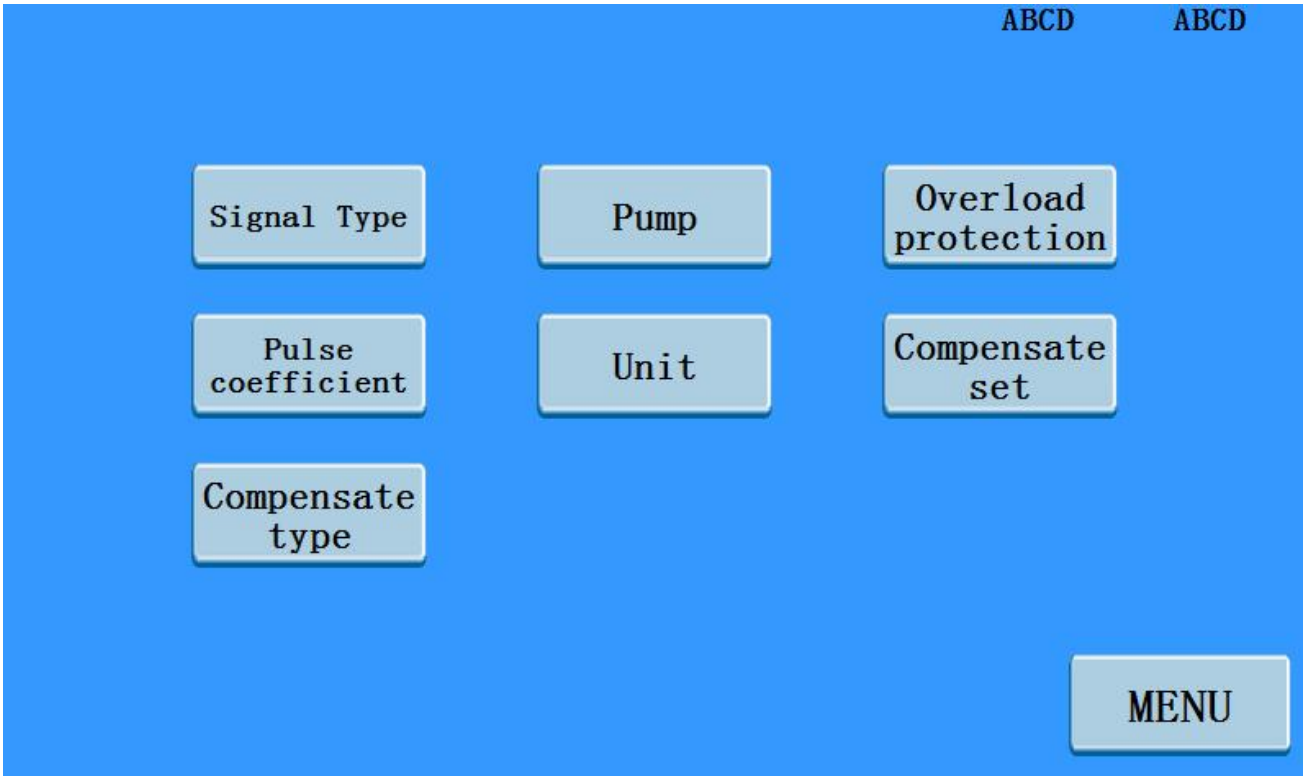
Stop: the device stops after operation.

Abnormal flow: the instantaneous flow during the set time is less than the predetermined value (refer to 5.1.3 for details).

Chapter 5 Parameter setting and auxiliary screen

5.1 Flow rate configuration

Configuration position: parameter set flow



5.1.1 Input signal settings

Signal input type: 4-20 mA \ pulse \ RS485.

Selection of flow unit: m3/h L/h T / hKg / hg / hL / m.

Compensation method: fixed density, other liquid (the density of the input medium varies with the temperature).

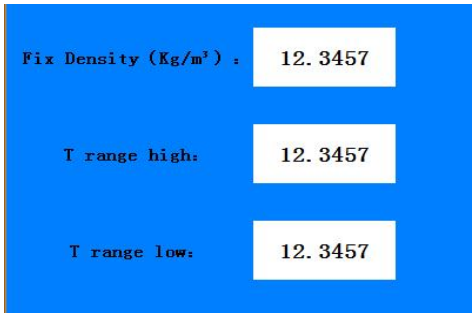
5.1.2 Compensation setting

The compensation method is fixed density: fixed density (Kg/m3).

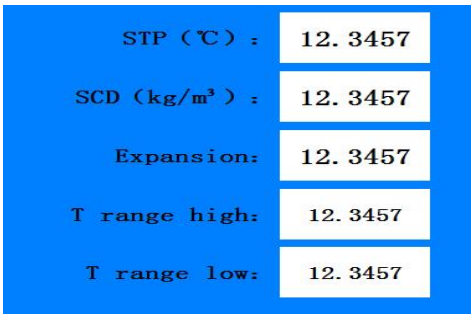
The compensation method is for other liquids: standard condition temperature (℃), standard condition density (kg/m³), expansion coefficient, upper limit of temperature range, and lower limit of temperature range.

The configuration interface is as follows:

Fixed



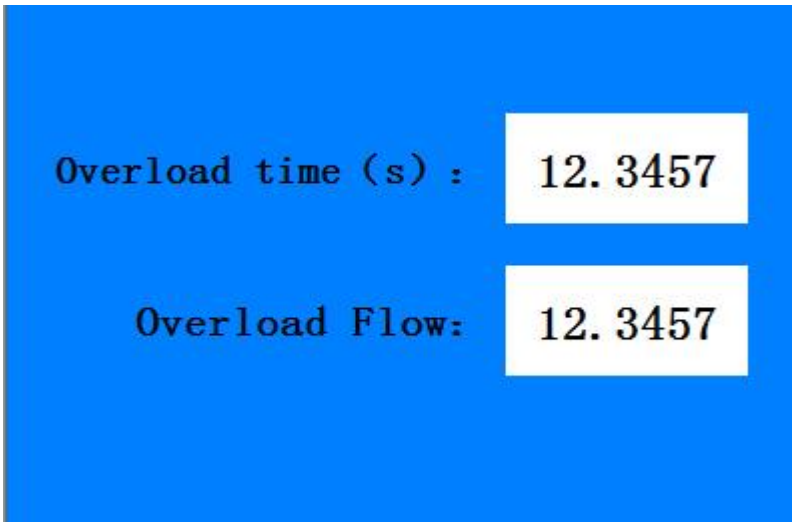
Other



5.1.3 Output signal setting

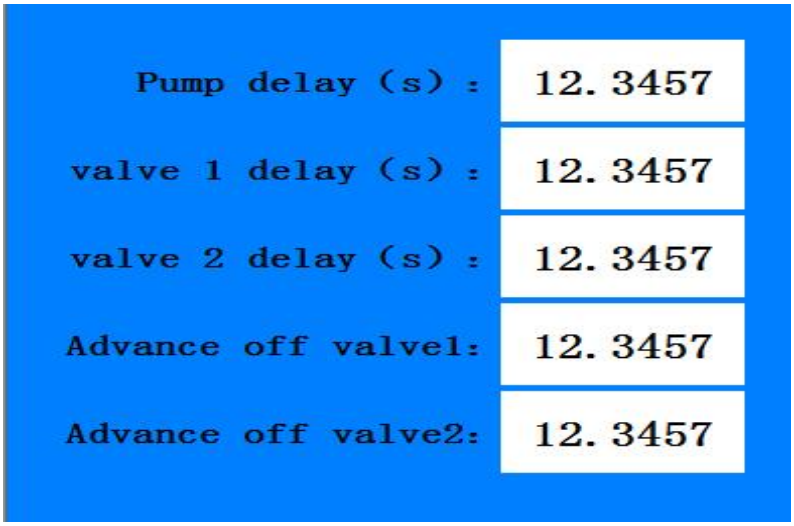
No-load protection: After the equipment is started, when the instantaneous flow is lower than the no-load flow and exceeds the no-load time, the equipment is immediately stopped to prevent the equipment from idling and burning the electric pump (the no-load time "0" means disabled this function).

The configuration interface is as follows:



Pump valve setting: the pump, valve start, sequence and valve advance can be set.

The configuration interface is as follows:



5.1.4 Parameter settings of the pulse input type

Pulse coefficient setting: 00000.000 times / m3.

Small signal resection: 00.00HZ resection pulse interference signal.(Refer to 5.2.1 for more details)

Pulse coefficient correction: correct the pulse flow signal error.(Refer to 5.2.3 for more details)

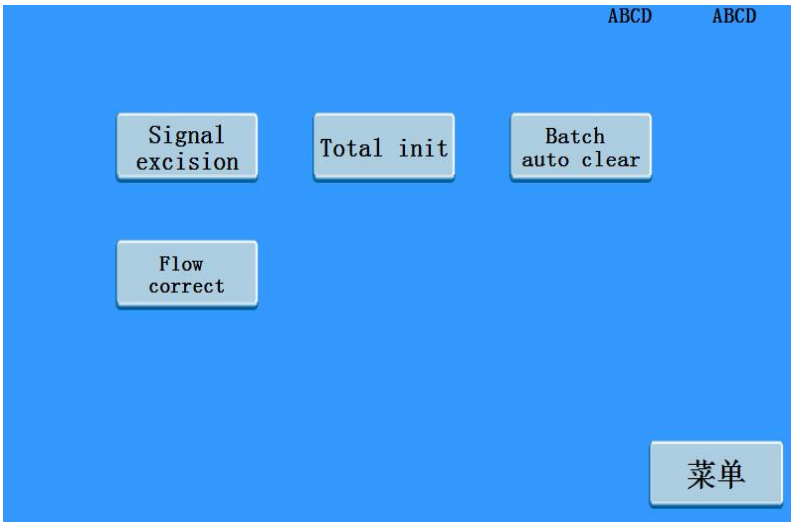
5.1.5 4-20 mA Input type parameter setting

Range setting: set the upper and lower limits of the flow range.

Small signal resection: 00.00mA resection milliampere value interference signal.(Refer to 5.2.1 for more details)

5.2 Correct the configuration

Configuration position: set the correction



5.2.1 Interference signal correction

Small signal excision: 1, 00.00mA 2, 00.00HZ.

0.3 indicates that the millipere signal is greater than 4.3 mA.

5.2.2 Accumulated flow setting

Total Initial Value: Enter the total cumulative flow value to set here.

Batch automatic zero clearance: 1, turn on 2, close.

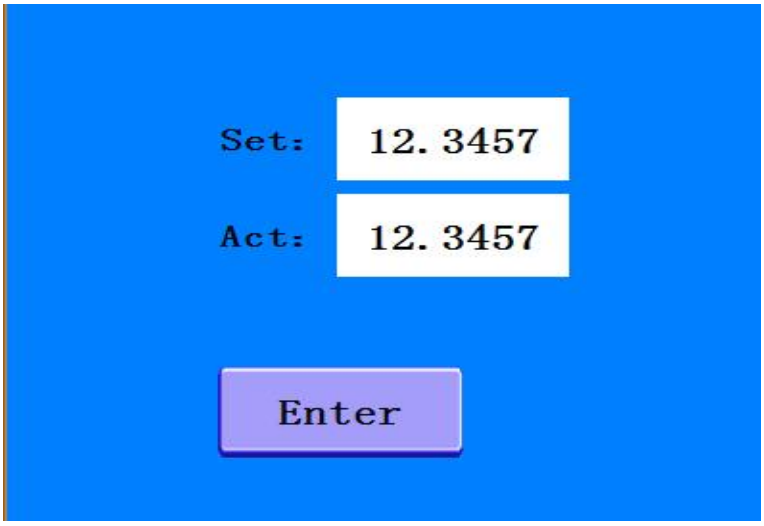
After this function is enabled, the batch is automatically cleared after all the circulating batches are stopped.

5.2.3 Correction of pulse coefficient (signal type is valid for pulse signal input)

When the pulse signal is wrong, fill in the quantitative set value at the quantitative value and the actual filling value to achieve the correction of the pulse coefficient.

Quantitative value: the set quantitative value. Actual value: the actual filling value.

The configuration interface is as follows:



5.3 Formulation configuration

Custom edit recipe

: Add a single formula

: Delete one recipe

: Insert a recipe

: Copy one recipe

: Save the newly added formula

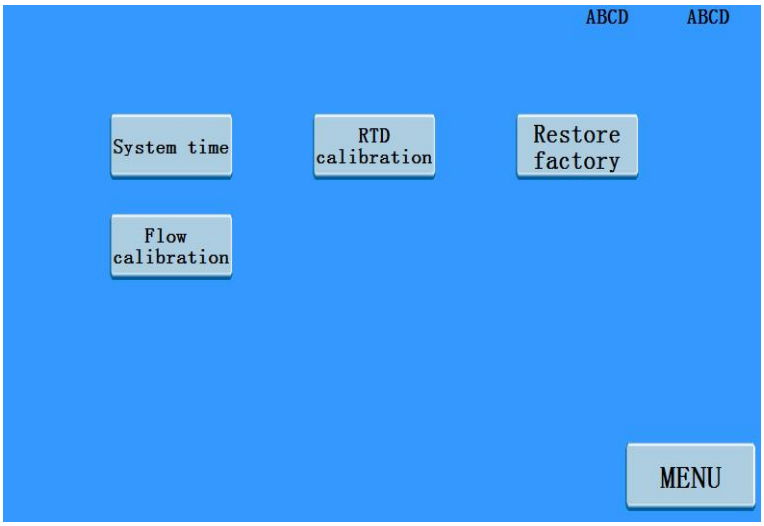
: Uppage

: Next page

: Use the formula

5.4 System configuration

Configuration position: Set up the system



5.4.1 Time setting

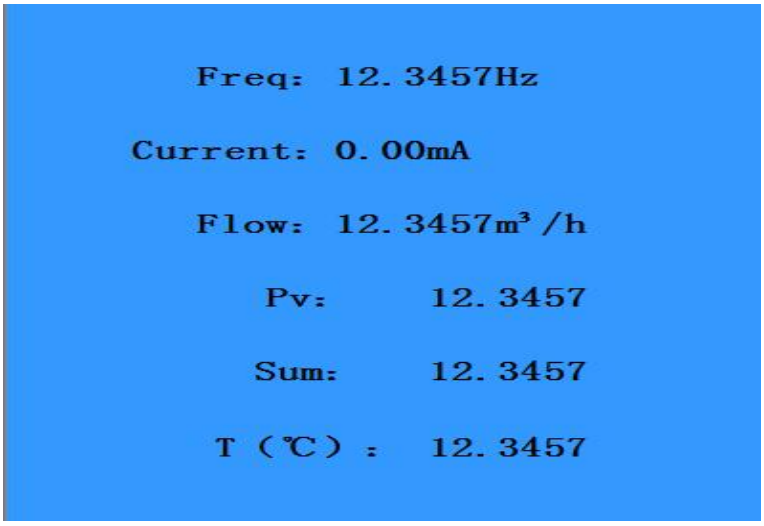
Enter the good value and click to confirm

5.4.2 Change the password

5.4.3 Resume the factory: the reset equipment is the initial value.

5.5 Signaling debugging

Configuration location: signal debugging on the home page



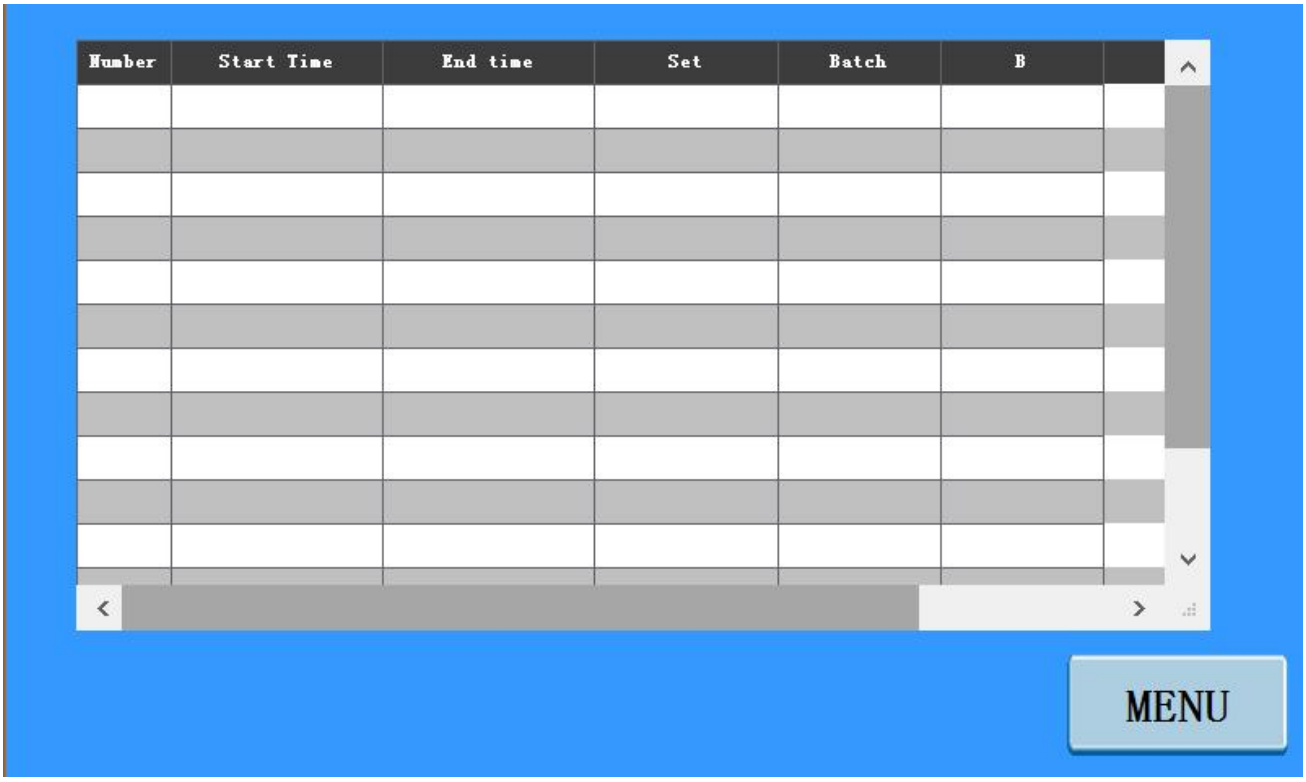
The configuration interface is as follows:

Monitoring function: the signal debugging interface can clearly view the input signal value, so as to judge whether the connected acquisition signal is accurate.

5.6 Record query

Configuration location: the filling record

The configuration interface is as follows:



The corresponding record can be found according to the time period

Chapter 6 communication

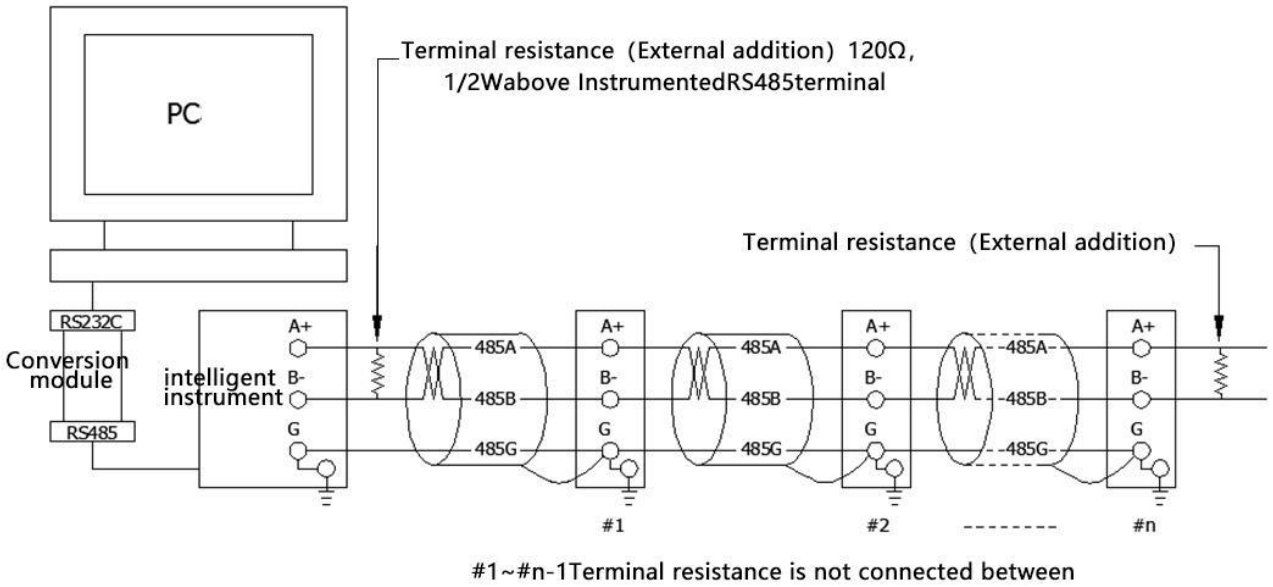
The instrument can provide RS485 communication and bill printer interface and support the standard Modbus RTU protocol.

6.1 Printer connection (optional)

It is mainly used for communication with the bill printer. When the printer is not on or offline, the instrument executing the printing function does not respond. At this time, the user should check the printer power supply and the status indicator light to see whether each state is correct and whether the printing paper is installed in place. If it cannot print normally, please check the printer setting (port rate, data format, serial port setting, etc.).

6.2 RS485 Communications

The communication line should be shielded twisted pair (the communication length should not exceed 100 meters), one end of which is connected to the serial communication port of the computer through the RS485 conversion module, and the other end is connected to the 485 communication terminal of the meter. The connection mode is shown below.



#1~#n-1Terminal resistance is not connected between

6.3 RS485 communication parameters

project	Set content
Operating mode	ModbusSlave
address	1~247Optional
Baud rate	1200/2400/4800/9600/19200/38400/57600Optional
data format	8 data bits, 1 stop bit
Validation	No validation

6.4 Register address list

Function code 03:01030000001EC5C2

address	content	form	mode of operation
0x0000	The current model	Uint16	RO
0x0001	The current batch	Uint16	RO
0x0002	current state 0x0000: Stop 0x0001: Wait to start 0x0002: Waiting interval 0x0003: Filling in 0x0004: Pause 0x0005: Abnormal flow rate	Uint16	RO
0x0003	unit 0x0000：m^3/h 0x0001：L/h 0x0002：T/h 0x0003：Kg/h 0x0004：g/h	Uint16	RO
0x0004 0x0005	Quantitative value (three decimal places) Example: 07 5B CD 15 = 123456789 = 123456.789	Uint32	RW
0x0006 0x0007	Instantaneous (three decimal places)	Uint32	RO
0x0008 0x0009	Components (three decimal places)	Uint32	RO
0x000A 0x000B	Batch size (in three decimal places)	Uint32	RO
0x000C 0x000D	Total integer	Uint32	RO
0x000E 0x000F	Total decimal place (three decimal places) Example 00 00 00 7B = 123 = 0.123	Uint32	RO
0x0010 0x0011	Batch number 0-65535	Uint32	RW
0x0012	Interval time of 065535 seconds	Uint32	RW

0x0013			
0x0014	lead	Float	RW
0x0015			
0x0016	temperature	F loat	RO
0x0017			
0x0018	Year (HEX) example: 07 E2 = 2018	Uint16	RW
0x0019	moon	Uint16	RW
0x001A	sun	Uint16	RW
0x001B	time	Uint16	RW
0x001C	component	Uint16	RW
0x001D	second	Uint16	RW
0x001E	electric relay Bit 0 to bit 4-1 to 5:1 close 0 disconnected	Uint16	RO

Chapter 7 Fault Analysis and use examples

7.1 Fault analysis

The quantitative controller adopts the advanced production process and conducts strict tests before leaving the factory, which greatly improves the reliability of the instrument. Common faults are generally caused by improper operation or parameter setting. If any unsolved fault is found, please record the fault phenomenon and promptly notify the local agent or contact us.

The following table shows several common faults of the quantitative controller in daily application:

order number	fault phenomenon	Cause analysis and treatment
1	**After pressing the start button Show abnormal flow after 5 seconds!!!**	1、 Please check whether the flow input signal cable is properly connected or is loose. 2、 Please check whether the valve and the pump body are started normally. 3、Enter the equipment detection menu interface to check whether the signal input and relay operation are normal.
2	**The actual flow rate does not match the quantitative value (Exclude sensor issues first)**	1、 Please reset the lead quantity parameter. 2、 Please check whether the flow input signal is normal. 3、 Wrong instrument factor set. 4、 Range decimal point is set wrong. 5、Unit setup error.
3	**Electricity does not work**	1、 Poor contact with the power cord. 2、The power supply voltage does not meet the technical requirements.

7.2 Use examples

The flow rate is divided into mass flow rate (T / hKg / hg / h) and volume flow (m3/h L/h L / m).

in compliance with:

Meuring methanol medium: input signal selection (4-20 mA), range setting, compensation selection (fixed density) and compensation setting (fixed density 786.4674 kg / m3).

Metering water medium with temperature compensation: input signal selection (pulse), pulse coefficient setting, access to the temperature sensor, compensation selection (water temperature).

The expansion coefficient compensation is required in the measurement: input signal selection (pulse), pulse coefficient setting, access to the temperature sensor, compensation selection (other liquid), compensation setting (standard condition density, expansion coefficient).

Measuring general liquid flow does not compensate for water medium: input signal selection (pulse), pulse coefficient setting.

Chapter 8 The Service Guide

Dear users: Hello! Thank you for choosing this department instrument. The company will thank you for your trust with your excellent service. For the first use of the instrument, first check whether the actual configuration of the product is consistent with the instrument configuration sheet, and whether the packing items such as random data and accessories are complete. If you have any objection, please contact us first.

■ **matters need attention**

- Read the random materials: please read the random materials and warranty principles carefully, and keep them completely.
- After the purchase, keep the purchase invoice properly.

Warranty principles:

■ **maintenance cycle**

Five working days from the date of receipt of the product.

■ **maintenance and repair cost**

- The free warranty period of this series of quantitative controllers is 18 months (product quality problem).
- The warranty period shall be calculated from the date of purchase by the user, and the user's purchase invoice (indicating the product model, host serial number) or the copy shall be taken as the certificate. If the invoice cannot be provided, it shall be calculated from the date of our production.
- During the warranty period, the products damaged due to improper use by the customer, or the customer has opened the product qualified seal. After the product repair, it can be free warranty for half a year.

■ **Customer instructions**

- Please be sure to send the product back with a product fault description to help the engineer fix it as soon as possible.
- Please fill in the telephone / fax number, mailing address and contact person accurately for the return of repair products.
- If you want the engineer to go to the site for repairs, you must bear the costs incurred thereby.

The company usually sends it back by express mail (without insurance). If you need to transport it by other parties, please indicate it in the form and pay the relevant fees.